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Introduction

Teaching profile

Learning outcomes

The primary objective of the "polytechnic" minors organized by the Faculté des Sciences Appliquées is to allow students taking a baccalaureate in engineering science, if they so wish, to acquire, through a polytechnic major/minor, basic training in two specialist areas of engineering science, and thus to broaden their technical range of skills, or prepare for a master's in engineering science in a domain which spans the various basic courses offered at baccalaureate level. The disciplinary objectives of the minor in applied mathematics are to allow the student to acquire training in the basic concepts of the discipline, and, more specifically, to: Acquire basic skills in and knowledge of the fundamental disciplines in applied mathematics (optimization and operational research, algorithm and discrete mathematics, differential equations and dynamic systems, numerical analysis, statistics and probability) Gain an introduction into how mathematical models for engineering are designed, analyzed implemented in industry and organizations as well as drawing up effective strategies to improve the way such models work

On successful completion of this programme, each student is able to :

- Acquérir les connaissances et les compétences de base dans les disciplines fondamentales des mathématiques appliquées (optimisation et recherche opérationnelle, algorithmique et mathématiques discrètes, équations différentielles et systèmes dynamiques, analyse numérique, statistiques et probabilités).
- S'initier à la conception, l'analyse et la mise en Œuvre de modèles mathématiques pour l'ingénierie dans le monde industriel ou organisationnel et pour l'élaboration de stratégies efficace d'optimisation de leur performance.

Detailed programme

PROGRAMME BY SUBJECT

○ Mandatory

△ Courses not taught during 2015-2016

⊕ Periodic courses taught during 2015-2016

⊗ Optional

⊖ Periodic courses not taught during 2015-2016

■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Year

2 3

○ Cours obligatoires de la mineure en mathématiques appliquées. (20 credits)

Course Code	Course Title	Instructor	Hours	Credits	2015-2016	2016-2017	Requisites
○ LMAT1223	Differential equations	Jean Van Schaftingen	30h+15h	5 Credits	2q	x	
○ LINMA1170	Numerical analysis	Paul Van Dooren	30h +22.5h	5 Credits	1q	x	
○ LINMA1691	Discrete mathematics - Graph theory and algorithms	Vincent Blondel, Jean-Charles Delvenne (compensates Vincent Blondel)	30h +22.5h	5 Credits	1q	x	
○ LINMA1702	Applied mathematics : Optimization I	François Glineur	30h +22.5h	5 Credits	2q	x	

○ Premier cours au choix de la mineure en mathématiques appliquées (5 credits)

Les étudiants choisissent un des deux cours de cette liste. Si les étudiants ont une majeure comportant déjà l'un de ces cours, ils peuvent soit choisir l'autre cours, soit choisir 5 crédits parmi la liste des seconds cours au choix de la mineure en mathématique appliquées.

⊗ LINMA1510	Linear Control	Denis Dochain	30h+30h	5 Credits	2q	x	
⊗ LINMA1731	Stochastic processes : Estimation and prediction	Pierre-Antoine Absil, Luc Vandendorpe (coord.)	30h+30h	5 Credits	2q	x	

o Second cours au choix de la mineure en mathématiques appliquées (5 credits)

Les étudiants choisissent un minimum de 5 crédits de cette liste. Les cours choisis ne peuvent pas faire partie de la majeure suivie par l'étudiant. Il peut également proposer d'autres cours à l'approbation de la commission de programme en mathématiques appliquées.

Les étudiants qui n'ont pas pris le cours LFSAB 1507 Projet 4 en mathématiques appliquées, dans le cadre du tronc commun, peuvent le prendre dans le cadre de la mineure

⊗ LELEC1350	APPLIED ELECTROMAGNETISM	Christophe Craeye, Danielle Janvier	30h+30h	5 Credits	1q	x
⊗ LELEC1360	TELECOMMUNICATIONS	Luc Vandendorpe	30h+30h	5 Credits	2q	x
⊗ LGBIO1112	Introduction to biomedical engineering	Philippe Lefèvre	45h	5 Credits	2q	x
⊗ LIEPR1024	Fundamentals of neurophysiology and neuropsychology in motor control and motor learning	Julie Duque, Marcus Missal (coord.)	45h	5 Credits	1q	x
⊗ LINGI1101	Discrete mathematics: logical foundations of computing science	Peter Van Roy	30h+30h	5 Credits	1q	x
⊗ LINGI1123	Computability and complexity	Yves Deville	30h+30h	5 Credits	2q	x
⊗ LINMA1315	Mathematical analysis : complements	Michel Willem	30h +22.5h	5 Credits	2q	x
⊗ LINMA1510	Linear Control	Denis Dochain	30h+30h	5 Credits	2q	x
⊗ LINMA1731	Stochastic processes : Estimation and prediction	Pierre-Antoine Absil, Luc Vandendorpe (coord.)	30h+30h	5 Credits	2q	x
⊗ LMAT1222	Complex analysis	Luc Haine	30h+15h	5 Credits	2q	x
⊗ LMAT1371	Probability	Johan Segers	30h +22.5h	5 Credits	2q	x
⊗ LMECA1100	Deformable solid mechanics.	Issam Doghri	30h+30h	5 Credits	2q	x
⊗ LMECA1321	Fluid mechanics and transfer phenomena.	Vincent Legat, Grégoire Winckelmans	30h+30h	5 Credits	2q	x
⊗ LMECA1901	Continuum mechanics.	Philippe Chatelain, Philippe Chatelain (compensates Emilie Marchandise), Emilie Marchandise	30h+30h	5 Credits	1q	x
⊗ LSINF1121	Algorithmics and data structures	Pierre Schaus	30h+30h	5 Credits	1q	x

COURSE PREREQUISITES

A document entitled [en-prerequis-2015-min-lmap100i.pdf](#) specifies the activities (course units - CU) with one or more pre-requisite(s) within the study programme, that is the CU whose learning outcomes must have been certified and for which the credits must have been granted by the jury before the student is authorised to sign up for that activity.

These activities are identified in the study programme: their title is followed by a yellow square.

As the prerequisites are a requirement of enrolment, there are none within a year of a course.

The prerequisites are defined for the CUs for different years and therefore influence the order in which the student can enrol in the programme's CUs.

In addition, when the panel validates a student's individual programme at the beginning of the year, it ensures the consistency of the individual programme:

- It can change a prerequisite into a corequisite within a single year (to allow studies to be continued with an adequate annual load);
- It can require the student to combine enrolment in two separate CUs it considers necessary for educational purposes.

For more information, please consult [regulation of studies and exams](#).

THE PROGRAMME'S COURSES AND LEARNING OUTCOMES

For each UCL training programme, a [reference framework of learning outcomes](#) specifies the competences expected of every graduate on completion of the programme. You can see the contribution of each teaching unit to the programme's reference framework of learning outcomes in the document "In which teaching units are the competences and learning outcomes in the programme's reference framework developed and mastered by the student?"

The document is available by clicking [this link](#) after being authenticated with UCL account.

Information

Liste des bacheliers proposant cette mineure

- > [Bachelor in Engineering](#) [en-prog-2015-fsa1ba]
- > [Bachelor in Mathematics](#) [en-prog-2015-math1ba]

Admission

This polytechnic minor is intended chiefly for students enrolled on the baccalaureate in engineering science (civil engineer and civil engineer architect). The minor in applied mathematics is accessible to students who are enrolled on a baccalaureate in mathematical science, physical science or IT science. All of the minor courses are accessible provided the student undertakes basic training in mathematics, the content of which is equivalent to that of mathematics courses over the three first quadrimesters of the baccalaureate civil engineer. For the course INMA1731, basic training in probability and statistics is also required

Possible trainings at the end of the programme

Majors-minors leading directly to a master's course(s) : For students who have performed well and obtained a bachelor's qualification in engineering science - civil engineering, the polytechnic minors guarantee them, as part of a program which includes one of these minors, unconditional access, without additional training, to the civil engineering master's which corresponds to this minor. For the minor in applied chemistry and physics: the civil engineering master's in chemistry and material science and the civil engineering master's physicist For the minor in construction : the civil engineering master's in construction For the minor in electricity: the civil engineering master's electrician For the minor in IT: the civil engineering master's in IT For the minor in mechanics: the civil engineering master's mechanic For the minor in applied mathematics: the civil engineering master's in applied mathematics For a program which combines the major in electricity/minor in mechanics, or major in mechanics/minor in electricity: the civil engineering master's electromechanic.

Contacts

Curriculum Management

Entite de la structure MAP

Acronyme	MAP
Dénomination	Commission de programme - Ingénieur civil en mathématiques appliquées
Adresse	Avenue Georges Lemaître 4-6 bte L4.05.01 1348 Louvain-la-Neuve Tél 010 47 25 97 - Fax 010 47 21 80
Secteur	Secteur des sciences et technologies (SST)
Faculté	Ecole Polytechnique de Louvain (EPL)
Commission de programme	Commission de programme - Ingénieur civil en mathématiques appliquées (MAP)

Academic Supervisor : [Pierre-Antoine ABSIL](#)

Jury:

Usefull Contacts

Secrétariat : [Nathalie PONET](#)

Infos

